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PAYNE INSTITUTE COMMENTARY SERIES: **COMMENTARY**

Clearing the Non-Technical Hurdles for CCS

By Brooke Bowser, Brad Handler, Anna Littlefield and Morgan Bazilian

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The oil and gas industry began injecting carbon dioxide into the ground in the 1970s as a technique to produce more oil (now called enhanced oil recovery), but today there is a renewed interest in CO_2 injection for carbon capture and storage (CCS) projects — this time as a way to address climate change. Despite CCS technology itself being decades-old, persistent regulatory and liability questions paired with limited economic viability threaten development, even as the industry appears to be gathering momentum for large-scale growth.

The global installed capacity of CCS is about 40 million metric tonnes per year, only ~0.1% of the 36.3 billion of metric tonnes of energy-related CO_2 emissions produced in 2021. If CCS is to be an integral part of the global strategy to reduce emissions – and most climate action plans suggest it must be – there will need to be massive scale-up of the technology.

The U.S. is following the trend of national governments around the world aiming to cut emissions by expanding CCS. In May, the U.S. Department of Energy announced it would set aside $2.25 billion for CCS projects. There have also been various legislative proposals to enhance the 45Q federal tax credit, which currently provides CCS project owners with a credit of $50 per tonne of CO_2 emissions sequestered.

SLUGGISH APPROVALS

The industry's attempts to navigate the early stages of commercialization have exposed gaps in the underdeveloped legislation and regulatory processes.

One of the biggest challenges new CCS projects face is the EPA's slow permitting process. The EPA has only granted two Class VI well permits to date, and they both took roughly six years to process. Fourteen additional permits have been submitted to the EPA and are pending a decision.

The pace reflects, at least in part, the fact that establishing and enforcing regulations that are appropriate for all CCS projects is inherently difficult due to the heterogeneity of natural systems. The permitting process must account for the nuance of each individual project, and while operators and permitting entities become more familiar with the requirements, the process is slow and iterative. Critics argue, however, that the administration can do far more to streamline U.S. regulations, which may span up to 15 federal statutes depending on the CCS location, and speed approvals. To that end, the White House Council on Environmental Quality earlier this year began to consider revising regulations that may provide some relief.

To expedite the permitting process, some states have elected to assume responsibility by adopting primary approval authority, often referred to as primacy. While many states, tribes, and territories have primacy for other classes of wells, only two states, North Dakota and Wyoming, currently have primacy for CCS projects.

The EPA has to approve the primacy application, which must detail requirements that are at least as strict as federal regulations. Timeframes appear to be improving: the agency took five years to approve North Dakota's application in 2018, but only one year to approve Wyoming's application in 2020. Texas and Louisiana, two states with high emission rates and carbon storage potential, are likely to be among those next in line to gain primacy. Arizona and West Virginia are in the pre-application stage, and other states, including Colorado, are also considering applying.

LIABILITY

Once permitted, a CCS project developer next faces legal uncertainty over who has the rights to use the space underground where CO_2 is stored. In states where law is settled, this subsurface pore space generally belongs to the surface owner who can sell or lease rights as a separate property from the surface. However, the issue is not settled in many key states including Texas, Colorado and California. Legally, the uncertainty creates potential challenges over whether mineral rights take precedence over use of the pore space. Another related issue is that of trespass, in the case the stored CO_2 migrates to others' property.

The growth of CCS also remains hindered to some degree by management or the perception of long-term risks. To date, no leakage has been detected from the handful of dedicated CO_2 storage projects. Yet the uncertainty about the liability associated with leakage, coupled with the perpetual nature of this so-called stewardship phase, poses a challenge. Operators are required to provide evidence of financial responsibility as part of the Class VI permitting process. The EPA requires demonstration that sufficient resources are available for any maintenance, remediation, plugging operations, and emergency response, outlined in detail in their Financial Responsibility Guidance documentation. Even with these standards, however, many project operators or insurance companies are hesitant to accept legal responsibility for a never-ending project, especially given the nascent stage of large-scale CCS.

In the absence of federal legislation, Indiana, Wyoming, Louisiana, Montana, and North Dakota have all outlined their own processes to assume long-term liability for potential leakage or damages from CCS projects (some of these states have also recently clarified access issues such as pore space as discussed above and a separate issue known as unitization). However, each state has varying qualifications and caveats for when it becomes responsible. Indiana, for example, passed legislation earlier this year that transfers liability to the state as soon as the CCS project is granted a certification of completion. Other states assume the liability after a monitoring phase — as long as 50 years in Montana. Further, the degree of financial cover varies by state. Many states collect fees or surety bonds to establish a fund to pay for the cost of damages, but if the cost exceeds the designated funds, the liability once again becomes unclear. In Louisiana, for example, if the damage exceeds the available amount, the operator's responsibility for non-economic compensatory damages is capped, whereas in Wyoming the operator could still be liable for damages that surpass than the state's fund.

MOVING FROM MILLIONS TO BILLIONS

These permitting and long term liability challenges appear to reflect lingering controversy regarding the role of CCS. First, environmental justice activists have decried CCS's role in enabling continuing fossil fuel use. Second, concerns about states or the federal government assuming long term liability for sites include Moral Hazard, i.e. a condition that would allow developers to not exercise as much care because of the government indemnification.

While operators continue to announce new carbon capture and storage projects worldwide, the lack of regulatory and legal clarity from permitting agencies could deter domestic progress of CCS efforts. A balance must be struck to ensure a rigorous but reasonable permitting process to encourage responsible development. Given the pressing need to address climate change and the significant role that CCS is expected to play in a low-carbon future, there is an equally pressing need to construct a path forward that will allow the industry to scale quickly.

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